DRAFTING TECHNOLOGY AND ENGINEERING

School of Mathematics, Computer Science and Engineering

Acting Dean: Dixie Lee Bullock
Academic Chair: TBA
Faculty: Joe Anand, Craig Monroe, Matthew Wolken

CURRICULUM

Students majoring in drafting technology prepare to enter several areas of the technology, including mechanical, electrical and aeronautical/aerospace technology, and their various research and development fields. The curriculum emphasizes the universal language used in industrial, technical, and engineering applications. Students develop the skills needed to produce and interpret technical drawings, using traditional as well as multi-axis computer-based graphics generation. Laboratory experiences include working on many different types of drafting problems designed to refine the students' abilities to interpret, analyze and transmit facts graphically. Courses in the major and recommended electives stress the development of basic skills in mathematics, communication, and the sciences.

MAJOR

The program is designed to prepare students for employment within the broad spectrum of the drafting and design field. Various options are available to meet both short- and long-range educational goals. Students may select the technically specific certificate program or the broad-based Associate in Science degree in drafting technology or the computer-aided drafting design (CAD) emphasis. By completing the associate degree, the student ensures a high level of competency within the technology as well as developing a strong, broad-based foundation in preparation for future upgrade. Individual and sequenced courses are designed for those who are currently employed and wish to upgrade or specialize in a specific subject area.

CAREER OPTIONS

Examples of industry segments hiring drafters include the following:

- Automotive Design and Manufacturing
- Biomedical and Healthcare Manufacturing
- Computer Product Manufacturing
- Construction
- Computer Product Manufacturing
- Environmental Design
- Machinery Manufacturing
- Metal Manufacturing
- Military and Aerospace
- Professional and Scientific Technical Services
- Robotics and Automation
* Telecommunications
* Utilities and Local Government

ASSOCIATE DEGREE

- **Associate in Science Degree in Drafting Technology**

  Emphasis:
  Computer-Aided Design
  (Mechanical Option)

Students must complete a minimum of 60 units of credit, including the courses in the major ("Major Requirements") and general education requirements (pages 36-43), with an overall GPA of 2.0 or better. A minimum of 12 units must be completed at Irvine Valley College. See pages 32-35 for further information.

CERTIFICATE

- **Certificate of Achievement in Drafting Technology**

  Emphasis:
  Computer-Aided Design
  (Mechanical Option)

Students must complete all courses in the certificate program ("Major Requirements") with a grade of "C" or better. A minimum of 12 units in the certificate program must be completed at Irvine Valley College. See page 33 for further information.

TRANSFER PREPARATION

Courses that fulfill major requirements for an associate degree at Irvine Valley College may not be the same as those required for completing the major at a transfer institution offering a baccalaureate degree. Students who plan to transfer to a four-year college or university should (1) refer to the University Studies major (page 231) and "Transfer Planning" (page 47); (2) consult the catalog of their prospective transfer institution (see the IVC Transfer Center for assistance); and (3) schedule an appointment with an IVC counselor to develop a plan of study before beginning their program. It may be helpful to meet with the department faculty at IVC.

MAJOR REQUIREMENTS: DRAFTING TECHNOLOGY

Associate in Science Degree or Certificate of Achievement

Complete the following courses:		Units
DR 50	Introduction to Computer-Aided Drafting	3
DR 100	Fundamentals of Drafting and Design	3
DR 101	Engineering Drawing and Design	3
ENGR 21	Introduction to Engineering and Technology	1
ENGR 23	Engineering Graphics and Descriptive Geometry	3
ENGR 183	Computer-Aided Design Techniques	3
MATH 124	Trigonometry	3
MATH 253	Intermediate Algebra	5
	TOTAL UNITS:	**24**

COMPUTER-AIDED DESIGN EMPHASIS (MECHANICAL OPTION)

MAJOR REQUIREMENTS: DRAFTING TECHNOLOGY

Associate in Science Degree or Certificate of Achievement

Complete the following courses:		Units
CIM 100A	Computer Keyboarding and Document Processing I	2
DR 50	Introduction to Computer-Aided Drafting	3
DR 100	Fundamentals of Drafting and Design	3
DR 101	Engineering Drawing and Design	3
DR 102	Industrial Drafting and Design	3
ENGR 21	Introduction to Engineering and Technology	1
ENGR 23	Engineering Graphics and Descriptive Geometry	3
ENGR 183	Computer-Aided Design Techniques	3
ENGR 184	Advanced Computer-Aided Design	3
ENGT 140	Computer-Aided Manufacturing (CAM) Materials and Processes	3
MATH 124	Trigonometry	3
	TOTAL UNITS:	**30**

Recommended Electives:
ET 101, PHYS 2A, SP 1, WR 1

COURSES

DRAFTING

DR 50: INTRODUCTION TO COMPUTER-AIDED DRAFTING

3 Units
2 hours lecture, 4 hours lab
Transfers: CSU, UC
This is an introductory course in the operation and application of a computer-aided drafting (CAD) system that is used to create, modify, store and plot mechanical, architectural, and electronic drawings.Students create and analyze two-dimensional and pictorial drawings conforming to industry practices and standards. R-E-3

DR 100: FUNDAMENTALS OF DRAFTING AND DESIGN

3 Units
2 hours lecture, 4 hours lab
Transfers: CSU
This course is designed to develop basic drafting skills, including the proper use of multiview projection, sections and conventions, pictorial drawings, single auxiliary views, dimensioning and notation. Students construct industry-standard drawings using technical sketching and basic computer-aided design. NR

DR 101: ENGINEERING DRAWING AND DESIGN

3 Units
2 hours lecture, 4 hours lab
Transfers: CSU
This course is designed to develop the basic skills needed for industrial-level engineering drawing and conceptual design, including assembly drawings and detail drawings. The course introduces the fundamentals of mechanical design and strategies for creative design.It includes the basic design process used for machine drawings, castings, cams, weldments, and power transmissions, with integrated problems and solutions. NR

DR 102: INDUSTRIAL DRAFTING AND DESIGN

3 Units
2 hours lecture, 4 hours lab
Transfers: CSU
This course focuses on more advanced and complex methods used in constructing industrial drawings and designs. The course includes design methods, packaging design and development, reverse engineering, tooling drawings, jig and fixture design, toggles and linkages, stress analysis, and control systems. R-E-3

ENGINEERING (GENERAL)

ENGR 21: INTRODUCTION TO ENGINEERING AND TECHNOLOGY

1 Unit
1 hour lecture
Transfers: CSU, UC
This course provides an overview of occupations in engineering and related technologies. It is designed to familiarize students with the educational requirements for and opportunities for employment as a scientist, engineer, or technologist, as well as the nature and responsibilities of such work. NR

ENGR 23: ENGINEERING GRAPHICS AND DESCRIPTIVE GEOMETRY

3 Units
2 hours lecture, 4 hours lab
Transfers: CSU, UC
This course introduces the principles of graphic expression through sketching and computer-aided design. Students practice orthographic projection, auxiliary and section views, dimensions, and working drawings. Emphasis is on the use of points, lines, planes, warped surfaces, intersections and developments in solving problems in two- and three-dimensional space. NR

ENGR 183: COMPUTER-AIDED DESIGN TECHNIQUES

3 Units
2 hours lecture, 4 hours lab
Transfers: CSU
This advanced course presents the latest techniques available in three-dimensional computer-aided design. The course focuses on the use of the computer as a tool in all phases of the design process. Students work with computer-aided design systems, using 3D computer graphics to solve a variety of design problems. R-E-3

ENGR 184: ADVANCED COMPUTER-AIDED DESIGN

3 Units
2 hours lecture, 4 hours lab
Transfers: CSU
This advanced computer modeling course uses a high-function computer-aided design (CAD) system which offers design and manufacturing engineers a tool for two- and three-dimensional graphic applications. The course is intended to explore higher functions of CAD modeling systems using advanced modeling and software interfacing techniques. R-E-3

ENGINEERING TECHNOLOGY

ENGT 140: COMPUTER-AIDED MANUFACTURING (CAM) MATERIALS AND PROCESSES

3 Units
3 hours lecture
Transfers: CSU
This is an introductory course in engineering design concepts, functions, techniques, and materials. The course presents manufacturing methods and materials including computer-aided design (CAD), computer-aided manufacturing (CAM), manufacturing systems and plant layout, materials handling, process control cost and value, quality control, production control, and basic and advanced materials used in engineering design. NR